

SOIL SURVEY
of
YARMOUTH COUNTY
Nova Scotia

by
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CONTENTS

	PAGE
Acknowledgments	2
Introduction	5
General Description of the Area	5
Location and Extent	5
History and Development	5
Population, Towns and Industries	7
Transportation and Markets	7
Factors Affecting Soil Formation	9
Climate	9
Natural Vegetation	10
Soil Parent Material	11
Relief	13
Drainage	14
Time	14
Soil Development	14
Classification and Description of the Soils	16
Soil Survey Methods	16
Units of Classification	16
Key to Soils of the Area	16
Descriptions of the Soils	19
Soils Developed from Medium-Textured Glacial Till Parent Materials	19
Bridgewater Series	19
Riverport Series	22
Middlewood Series	23
Soils Developed from Moderately Coarse-Textured Glacial Till Parent Materials	23
Yarmouth Series	24
Mersey Series	25
Halifax Series	25
Gibraltar Series	26
Deerfield Series	27
Liverpool Series	28
Danesville Series	29
Bayswater Series	30
Pitman Series	31
Aspotogan Series	31
Soils Developed from Coarse-Textured, Stratified Parent Materials	32
Medway Series	32
La Have Series	33
Soils Developed from Medium-Textured Alluvial Materials	34
Chegoggin Series	34
Soils Developed from Organic Materials	35
Sedge Peat	35
Sphagnum Peat	35
Miscellaneous Soils	35
Swamp	35
Salt Marsh	35

	PAGE
Agriculture and Land Use	37
Present Land Use	37
Land-Use Capability	38
Suitability of Soils for Crops—Soil Rating	42
Discussion of Analytical Data	44
Loss on Ignition	44
pH	44
Lime Requirement	44
Nitrogen	44
Available Calcium and Magnesium	44
Available Potassium	45
Available Phosphorus	45
Cobalt	45
Summary	46

TABLES

I. Countries of Origin of Population, 1951	7
II. Mean Monthly and Seasonal Temperatures and Precipitation	9
III. Acreages and Percentages of the Total Area	15
IV. A Key to the Soils	17
V. Description and Acreages of Occupied Land, 1956	37
VI. Acreages in Field Crops	37
VII. Series, Descriptions and Acreages of Soils in Class III	39
VIII. Series, Descriptions and Acreages of Soils in Class IV	40
IX. Series, Descriptions and Acreages of Soils in Class V	41
X. Series, Descriptions and Acreages of Soils in Class VI	41
XI. Series, Descriptions and Acreages of Soils in Class VII	42
XII. Suitability for Selected Crops of Soils in Classes III and IV	43
XIII. Chemical and Physical Analyses of Representative Soil Profiles..	45
XIV. Available Nutrients in Soil Profiles	46

FIGURES

1. Location of the surveyed areas (map)	6
2. Population trend, 1871-1951 (chart)	7
3. Changes in precipitation and soil moisture (charts)	10
4. Bedrock formations (map)	12
5. Land-use capability classes (map)	18
6-9) Scenes of some typical soil series	pp.20, 21
10-14)	

INTRODUCTION

This report deals with the soils of Yarmouth County. The area was surveyed on a detailed reconnaissance basis during the summers of 1952-53.

The first section presents a general picture of the area and gives some idea of the nature of the soils, the factors affecting their formation, and how they were mapped and classified. The remainder of the report describes the individual soils, their agricultural value, and their distribution in the area.

The soils are rated for agricultural purposes. This rating is based on field observations, available yield data, physical and chemical analyses, and the morphology of the soils.

A soil map accompanies the report. The unit of mapping used was the soil series. Soil types within the series were not delineated but the variations found in the soil series are described. Because of the scale of mapping, small areas such as might occur on a single farm may not appear on the map.

Students of soil science may be interested in the sections dealing with the genesis and morphology of the soils. Economists will find information of value in the general description of the area, which covers such phases as population, transportation, markets, and industries. Soils of some particular area may be of interest to land settlement administrators, real estate agents and others. Persons interested in a particular area should locate it on the soil map and identify the soil or soils within it by color and symbol as they appear in the map legend which gives a brief summary of important information about individual soils. Additional information may be found in the body of the report.

GENERAL DESCRIPTION OF THE AREA

Location and Extent

Yarmouth County occupies the extreme southwestern end of Nova Scotia. The area is bounded on the south and southwest by the Atlantic Ocean, on the north by Digby County, and on the east by Shelburne County (Figure 1). Geographically Yarmouth County lies between $66^{\circ}10'$ and $65^{\circ}5'$ west longitude and between $43^{\circ}20'$ and $45^{\circ}15'$ north latitude and occupies an area of slightly over 895 square miles (573,228 acres).

History and Development

Yarmouth was visited by deMonts and Champlain in the summer of 1604. Cape Forchu at the entrance to Yarmouth harbor still bears the name given it by Champlain. The first white settlers were French. They settled at Chebogue, Chegoggin, Pubnico, and other coastal centers. After the expulsion of the Acadians in 1755, the entire area was abandoned until New England settlers arrived and took up residence.

Yarmouth County's prosperity and development have rested largely on fishing, lumbering, farming, and ship building. The latter was an important industry in the 19th century, but has declined with the passing of wooden ships.

The population in 1790 was approximately 1,300 and by 1827 it had risen to 4,350. By 1881 it had reached 21,284. The population declined between 1921 and 1931, but has increased steadily since. Figure 2 shows the trend between 1871 and 1951.

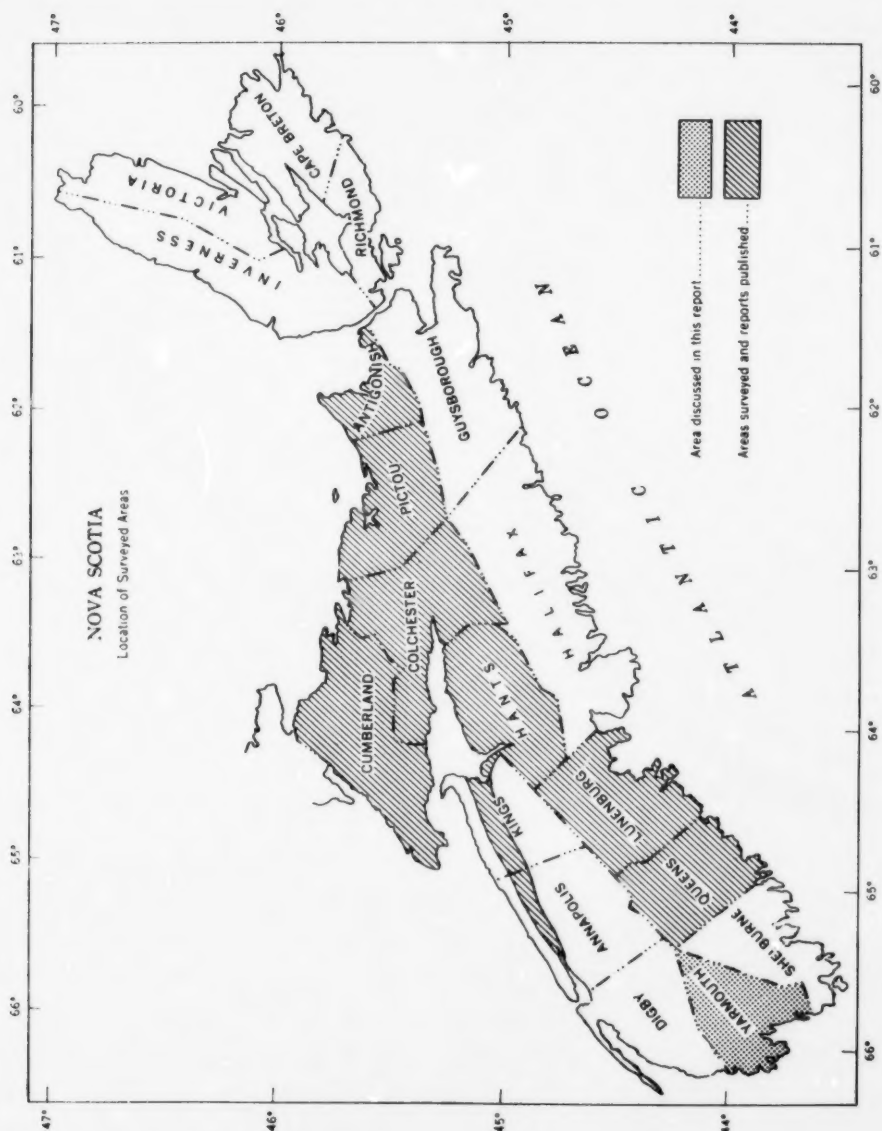


Figure 1. Areas of Nova Scotia in which the soils have been surveyed.

The population decline between 1911 and 1931 can be attributed to emigration to the United States and Ontario. The stock market crash in 1929 and the general depression that followed slowed the flow of Nova Scotians out of the Province and it is probable that many of the earlier migrants returned.

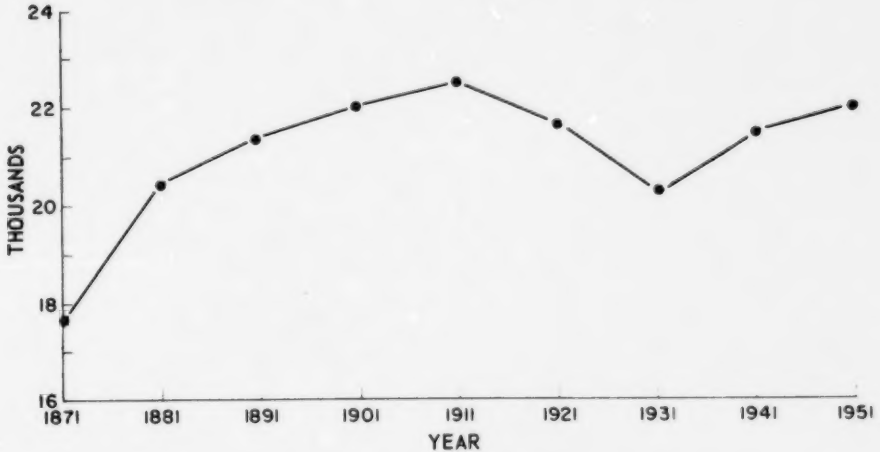


Figure 2. Population trend in Yarmouth County, 1871-1951.

Population, Towns and Industries

Yarmouth, the largest town, has a population of 8,106, approximately a third of the total. Wedgeport, with a population of 1,327, is the only other incorporated town in the County. Villages include Pubnico, Argyle, Eel Brook, Hebron, Carleton, Port Maitland and Chegoggin. These are all farming or fishing villages and, with the exception of Carleton, are on or near the seacoast.

TABLE I—COUNTRIES OF ORIGIN OF POPULATION, 1951

United Kingdom and Ireland	12,258
Germany	114
France	9,389
Netherlands	226
All others	807

22,794

Fishing, lumbering and farming are important in Yarmouth County. Industries closely related to fishing and lumbering are located in the Yarmouth area. These include building supplies, fish processing, and the preparation of fish oil and fish meal. Textiles and proprietary medicines are manufactured in the town of Yarmouth.

Transportation and Markets

The surveyed area is well supplied with transportation facilities within 10 miles of the coast. Farther inland there are few roads and the large area from Kemptville to the northeast corner of the County has no roads of any kind. The Canadian National Railway line from Halifax to Yarmouth passes through the southern coastal area and the Dominion Atlantic Railway serves the northern

part of the County and forms a connecting link between Yarmouth and Annapolis Valley centers. The communities of Pubnico, Tusket, Arcadia, Hebron, Deerfield, Carleton, and Norwood are served by one or other of these railways.

Transportation in areas not reached by rail depends on a network of highways and secondary roads. A paved highway extends from the southern border at Wood Harbour to the northern border at Beaver River. This is a portion of the paved highway skirting the entire southern end of the Province. The highways from Wedgeport to Arcadia, from West Pubnico to Pubnico, and from Hebron to Carleton are also paved. Good gravelled and secondary roads connect all of the inland communities with the larger centers and with each other.

All points on the paved highway through the County are served by Acadia Coach Lines and several transfer companies. A steamship service operates three times a week between Yarmouth and Bar Harbor, Maine, during the winter and daily during the summer. Yarmouth airport is a scheduled stop for passenger and mail service of Trans-Canada Air Lines.

Marketing of agricultural products does not present a problem in Yarmouth County at this time. Local markets can absorb all of the agricultural products raised in the area. The numerous villages and communities along the coast from Shelburne to Digby consume much of the local produce. Considerable quantities of most foodstuffs are brought into the area.

Fishing, lumbering and farming are the major industries. Lobsters are the mainstay of the fishing industry and nearly all are sold in United States markets.

FACTORS AFFECTING SOIL FORMATION

Climate

The climate of Yarmouth County is humid temperate. Long-term climatic data are available from the weather station at Yarmouth. The station nearest to this is at Saulnierville in Digby County. Information on precipitation and temperature over a number of years at these two stations is given in Table II. The data were compiled from reports of the Meteorological Division, Canada Department of Transport.

TABLE II.—MEAN MONTHLY AND SEASONAL TEMPERATURES AND
PRECIPITATION AT TWO STATIONS REPRESENTATIVE OF THE
SURVEYED AREA

	Yarmouth		Saulnierville	
	Temp., °F	Precipitation, in.	Temp., °F	Precipitation, in.
Years observed.....	59		22	
December.....	31	4.88 (15.7)*	29	4.15
January.....	26	4.49 (20.6)	26	3.80
February.....	26	4.24 (21.8)	24	3.23
Winter.....	28	13.61	26	11.18
March.....	32	4.17 (13.1)	32	3.32
April.....	40	3.44 (5.3)	39	2.93
May.....	48	3.51 (0.1)	48	2.35
Spring.....	40	11.12	39	8.60
June.....	56	2.99	56	3.14
July.....	61	3.38	61	3.22
August.....	61	3.47	61	3.11
Summer.....	59	9.84	59	9.47
September.....	56	3.59	56	3.92
October.....	49	4.15 (0.2)	49	3.88
November.....	40	4.12 (3.2)	39	3.60
Fall.....	48	11.86	48	11.40
Year.....	44	46.43 (80.0)	43	40.65

* Snowfall; (10 inches of snow=1 inch of rain.)

oak, yellow birch, red and white pine, poplar, hemlock, and balsam fir are found on the better-drained locations. Where drainage is restricted there is a predominance of black spruce, wire birch, tamarack, poplar and alder. Black spruce-tamarack swamps are common in the coastal areas, particularly in the southern part of the County. These areas often surround peat bogs, in which the dominant vegetation is sphagnum moss, club-moss, cat-tails, cotton-grass, and sedges. The poorly drained areas, where periodic flooding occurs along the more sluggish streams, have a predominant vegetation of sedges.

Large areas in Yarmouth County have been burned over by forest fires, many areas having been swept by fire several times. In these areas the regeneration of forest is rather slow. Since the climate is conducive to the rapid growth of heath, the burned-over areas generally have a cover of heath, blueberries, lambkill, sweet fern, and huckleberry, together with occasional red pine, wire birch and white spruce. Where burned-over areas are covered with bush growth, the dominant species are wire birch, poplar, red maple, willow and alder.

The marshes along the coast support a variety of salt-tolerant species of plants. These include saltwort, rockweed, sea-blite, juncus, and broadleaf species.

Soil Parent Materials

Practically all soils in Yarmouth County have developed from glacial drift. The material was deposited when Nova Scotia was last glaciated, perhaps 20,000 years ago. As the ice melted, much of the material held in or on it was deposited as glacial till, a heterogeneous mixture of clay, silt, sand, gravel and boulders, picked up by the ice during its forward movement and deposited when it melted. This material is largely derived from the underlying rocks and, for the most part, has not moved far from its point of origin. Some of the material, however, has been transported a considerable distance. This is evidenced in the gravels and till materials on the southern coast of the province which contain some basaltic rock fragments that could have come only from the North Mountain. Usually the till is derived from more than one kind of rock, except where a single underlying rock formation covers a large area.

Streams, which had their source in the ice, deposited a variety of water-sorted materials in the form of kames, eskers and outwash plains made up of coarse materials: sand, gravel, stones and boulders. In general these deposits occur near present-day rivers or streams and it is assumed that the stream courses are the remnants of larger post-glacial rivers that flowed from the ice front. Eskers, which are long sinuous ridges of roughly sorted materials, are presumed to have been deposited in the channels of streams that once flowed under the glacier. These esker ridges usually run from north to south, but a few run from east to west.

The bedrock formations of the County are shown in Figure 4. There are only two major geologic divisions represented in the area, namely, Devonian and Precambrian. The rock formations of Devonian age are muscovite and biotite granites and are exposed in three areas of the County. A long tongue of granite extends southwest for 20 miles or more from the northeast corner. Another large exposure occurs along the southeastern boundary extending into Shelburne County and a third small exposure outcrops west of Wedgeport. The granite rocks of this area are part of a giant igneous intrusion or batholith that underlies the southern upland from Yarmouth to Canso. Exposure of the granite has resulted from the erosion of thousands of feet of rocks of the Halifax and Goldenville formations.

Approximately one third of the County is underlain by Precambrian quartzite and quartz schist of the Goldenville formation. Alternating bands of quartzite and schist extend from the coast in a general northeasterly direction to the boundary of the County or to the area of granite exposure. These bands

range in width from five to ten miles. Near the granite contacts the rocks have been greatly altered and are sometimes coarsely crystalline or gneissic in character. Lying between the beds of quartzite and quartz schist of the Goldenville formation are beds or rocks of the Halifax formation. Except in several small areas, the rocks of this formation have been altered to mica,

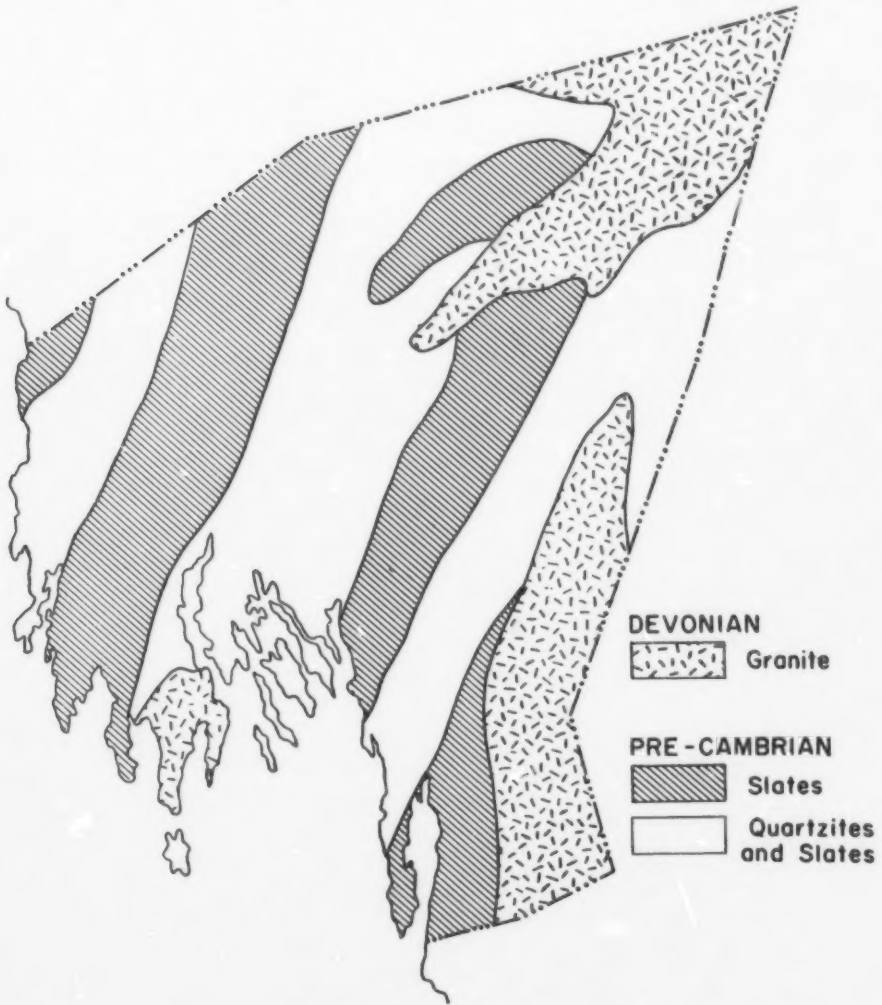


Figure 4. Bedrock formations of Yarmouth County.

staurolite and garnet schists. In Yarmouth County mica schist predominates. A narrow band of hornblende schist extends from Cape Forchu to Brazil Lake. Slate underlies small areas at Pubnico, Arcadia, and Kemptville.

The granites, quartzites, schists and slates furnished parent materials from which the soils of the area have developed. All of the soils can be classed as medium- to coarse-textured except for a few acres of marshland. Where depth of till is adequate and there is not too much stone, soils suitable for

agriculture have developed on the slate areas and on areas underlain by soft schist rock in the Yarmouth—Port Maitland area. Elsewhere the hard metamorphic and igneous rocks have not furnished parent materials from which good agricultural soils could develop. These areas are usually covered with boulders, and rock outcrops frequently occur.

The parent material of granitic origin is very coarse and gritty in texture and pale brown to light brownish gray in color. The soils are often very shallow over bedrock and in some areas are too thin to support forest growth. Boulders are numerous on the surface.

Quartzite and quartz schist have produced somewhat finer textured and less gritty parent materials than the granite. The texture is sandy loam or stony sandy loam and color ranges from light olive gray to olive brown. The soils developed on these materials are very stony and frequently shallow over bedrock. In the northern part of the County the till is deeper, probably because of mixing, by glacial action, of mica schist materials with the more-resistant quartzite and quartz schist. Some of these areas have been cleared and are used for agriculture. For the most part, however, the soils are limited in value except as forest soils, because of the presence of stones and boulders.

The principal agricultural soils in the County have developed from a modified glacial till derived chiefly from mica schist. In some areas quartzite materials have been mixed with the schist materials, but have not produced any marked changes in soil morphology. The entire western area from south of Yarmouth to Digby County and inland to Brazil Lake shows evidence of till modification by water action. This modified till is compact in place and downward movement of water is restricted. The parent material is a uniform olive gray in color and fine sandy loam in texture. Some areas are stony and present a clearing problem. However, large areas have been cleared and are being farmed with some success. Between Yarmouth and Port Maitland many drumlins have been deposited. Even on the relatively steep slopes of these drumlins, internal drainage is restricted by the compact subsoil.

In some areas, the parent materials are glacial till derived chiefly from schists or a mixture of schists and quartzite. Though very stony, the soils developed on these materials are deep and friable. The till is open and porous and ranges in texture from stony silt loam to stony sandy loam. The color of the till ranges from pale olive to olive gray. Stoniness is a limiting factor in the development of these soils for agriculture and only small areas have been cleared. In the well-drained areas they are well suited to forestry.

Relief

Yarmouth County is a gently to moderately undulating plain rising slowly from near sea level at the coast to an elevation of nearly 500 feet in the northeast corner. This highland represents the southwestern extremity of the southern upland of the province.

Areas underlain by granite are made up of a series of low, shapeless ridges rarely rising more than 50 to 100 feet above surrounding country. Lying between these ridges are depressional areas, usually occupied by sluggish streams or peat bogs. Areas underlain by quartzite are marked by long low ridges with an east-west trend. Occasional drumlinoid mounds of till occur, but, unlike the drumlins formed on schist and slate, they do not appear to have any particular form or direction. Drumlins are numerous in the coastal area from Argyle to Port Maitland. These drumlins are oriented in a north-south direction and they rarely exceed 150 to 200 feet in height. Some of the larger and higher drumlins occur south of Yarmouth and a number of these form small islands near the mouth of the Tusket River.

Drainage

A large part of central Yarmouth County is drained by the Tusket River and its tributary streams. The Tusket flows in a southerly or southwesterly direction throughout most of its course, but its feeder streams from the central upland flow in a westerly direction. Numerous small lakes in the interior of the County form the headwaters of this river.

The western section of the County is drained by small streams flowing west and southwest into the Atlantic Ocean. In the granite areas, most of the streams are shallow and sluggish, with boulder-paved channels, cut only slightly below the upland surface. When these streams reach the more easily eroded slates and schists, the channels deepen abruptly.

Time

It takes time to develop a mature soil from parent material. Such factors as climate, parent material, relief and biological activity all influence the rate and degree, of soil development. At present most of the soils have reached a fairly mature state of development and are in equilibrium with their environment. Bottom lands and salt marshes are young soils since periodic deposition of sediment prevents normal development of a soil profile. Marshland areas dyked for many years are beginning to show the effects of podzolization in the surface layers.

Soil Development

Interaction of the soil-forming factors described above tends to produce soils known as podzols. The process whereby such soils are developed is known as podzolization, and occurs under forest or heath vegetation where large amounts of acid plant residues are produced. The process requires sufficient moisture to promote removal and leaching of basic elements from the surface particles by organic acids. The bases thus released move downward in the drainage water, leaving the surface layers acid. As acidity increases in the upper layers, the silicate minerals tend to become unstable and break up. Iron and aluminum are dissolved and carried downward through the mineral soil and precipitated at a lower level in the profile.

Podzol soils in equilibrium with their environment have a number of specific layers or horizons. On the surface there is usually a thin layer of undecomposed plant residues. Beneath this are layers of organic matter in various stages of decay. These organic layers rest on an ashy-gray, leached horizon, usually high in silica and low in sesquioxides in relation to the parent material. Below the leached horizon is a zone of accumulation in which the iron and aluminum removed from surface layers have been deposited. The horizon of accumulation rests on the parent material from which the soil has developed and which is considered to have been unaffected by the soil-forming factors previously described. Soils with this general type of profile development are found throughout Nova Scotia, which lies within the cool temperate climatic zone.

Podzolization acts most effectively on porous, moderately coarse-textured parent materials. Gibraltar and Halifax soils are representative of this class in Yarmouth County. They have developed from glacial till derived from granite and quartzite respectively. Nearly all the soils in the area are similar in profile development. A description of the Halifax series, a well-drained soil, is given below. This profile was developed on moderately undulating topography under a mixed stand of poplar, white spruce, fir, and pine, and illustrates in a general way the type of soil development in well-drained areas of the County.

Horizon	Depth	Description
A ₀	2- 0 inches:	grayish-black, partly decomposed organic matter; fibrous; 2-4 inches thick; pH 3.8.
A ₂	0- 2 inches:	light-gray (10 YR 7/1) sandy loam; weakly developed crumb structure; friable; pH 4.3.
B ₂	2-12 inches:	strong-brown (7.5 YR 5/8) sandy loam; medium subangular blocky structure; slightly cemented; small angular quartzite fragments; pH 4.6.
B ₃	12-22 inches:	light-yellowish-brown (2.5 Y 6/4) sandy loam; structureless; moderately firm; porous; quartzite stones and cobbles; pH 5.0.
C	22— inches:	light-brownish-gray (2.5 Y 6/2) gravelly sandy loam; slightly compact; porous, numerous angular fragments of quartzite; pH 5.2.

The soils with imperfect drainage, such as Riverport, Lydgate and Deerfield, usually have a thicker organic surface than well-drained members of the same catena. The subsoils are mottled and usually the profiles are more shallow over parent material.

Soils with poor drainage, such as Aspotogan, Middlewood and Pitman, have a thick organic surface layer and a strongly mottled subsoil. Their characteristics are produced by gleyzation, a process in which the lowered oxygen content of the soil associated with excessive moisture, results in the formation of dull-colored, mottled horizons.

Very poor drainage has resulted in the development of bog soils. This class is represented in the area by the sphagnum and sedge peat bogs. Vegetation on the surface is largely restricted to sphagnum moss, sedges, cotton-grass and a few stunted black spruce and tamarack. Some of the peat bogs are shallow with two feet or less of peat overlying mineral material, but usually depths exceed five feet of partly decomposed moss and sedges.

TABLE III.—ACREAGES AND PERCENTAGES OF THE TOTAL AREA, OF THE SOILS IN YARMOUTH COUNTY

Soil Series	Acres	Percentage of total area
Bridgewater.....	3,488	.60
Riverport.....	2,505	.43
Middlewood.....	832	.15
Mersey.....	22,523	3.92
Liverpool.....	26,442	4.61
Halifax.....	157,491	27.47
Danesville.....	30,034	5.24
Yarmouth.....	31,405	5.48
Deerfield.....	18,976	3.31
Pitman.....	21,697	3.80
Gibraltar.....	114,845	20.00
Bayswater.....	8,648	1.51
Aspotogan.....	32,665	5.71
Medway.....	11,424	1.99
LaHave.....	1,920	.33
Chegoggin.....	723	.14
Sedge Peat.....	6,061	1.06
Sphagnum Peat.....	17,158	2.99
Swamp.....	1,101	.19
Salt Marsh.....	8,416	1.47
Coastal Beach.....	378	.07
Inland Water.....	54,496	9.53
Total.....	573,228	100.00

CLASSIFICATION AND DESCRIPTION OF THE SOILS

Soil Survey Methods

The survey of Yarmouth County was of the detailed reconnaissance type. A preliminary reconnaissance was made to determine the soils present in the area. Drainage, topography, outwash deposits and very stony areas or rock outcrops were plotted from aerial photographs on base maps with a scale of two inches to one mile.

In field work, soil boundaries were plotted from frequent observations along all roads and trails in the area. Where roads were scarce, foot traverses were necessary to establish soil boundaries. Topography, drainage and other details previously plotted from aerial photographs were carefully checked in the field. Notes were taken on vegetation, soils, crops, and suitability of the soils for agricultural use. The principal soil series were sampled for chemical and physical analyses. Profile samples were taken in undisturbed forested areas and each horizon was sampled separately, from the surface organic layer down to and including the parent material. The results of the analyses of these samples are given in the tables at the end of this report.

Units of Classification

The basic unit of mapping in the surveyed area was the soil series. A series is a group of soils developed from the same parent material and having genetic horizons similar as to differentiating characteristics and arrangement in the soil profile, except for the texture of the surface soil. Series differing in characteristics due to drainage form a catena. A series may include one or more soil types. In a survey of this kind it is not practical to map out all of the soil types that may occur. The dominant soil types are indicated and variations discussed in the text of the report.

Key to Soils of the Area

In Table IV the soils of the area are grouped into three broad classes: Podzolic, Gleysolic and Organic soils. Humus-iron Podzols are the dominant soils in the area. These soils develop typical characteristics of the Podzol great soil group as described previously. In the Gleysol group, full development of Podzol characteristics is prevented by poor drainage, and strong mottling or gleying occurs in the A and B horizons. The Organic soils include sedge peat and sphagnum peat.

In the vertical columns, the soils have the same kind and arrangement of horizons in the profile, but are separated on the basis of texture and lithology of the parent materials. Horizontally, the soils have similar parent materials, but differ in profile characteristics due to drainage. Thus the Halifax, Danesville, and Aspotogan soils are series members of a catena, the soils of which have developed from glacial till derived from quartzite and slate. From left to right in the table the soils go from well drained to poorly drained. This is accompanied by an increase in organic matter and nitrogen content.

The acreages of the various soils in Yarmouth County are given in Table III.

TABLE IV
A KEY TO THE SOILS OF YARMOUTH COUNTY

Parent Material	Lithology	Podzols		Gleysols	Organic Soils
		Good Drainage	Imperfect Drainage	Poor Drainage	
Medium-textured glacial till	Slate	Bridgewater	Riverport	Middlewood	
Moderately coarse-textured glacial till	Quartzite and slate Quartzite and schist Hornblende and mica schist Granite	Halifax Mersey Yarmouth	Danversville Liverpool Deerfield	Aspotogan Pitman Pitman	
		Gibraltar	Bayswater	Aspotogan	
Coarse-textured outwash	Quartzite and schist Slate	Medway LaHave			
Alluvial deposits	Grayish-brown silts			Chegoggin	
Organic deposits					Sedge peat Sphagnum peat

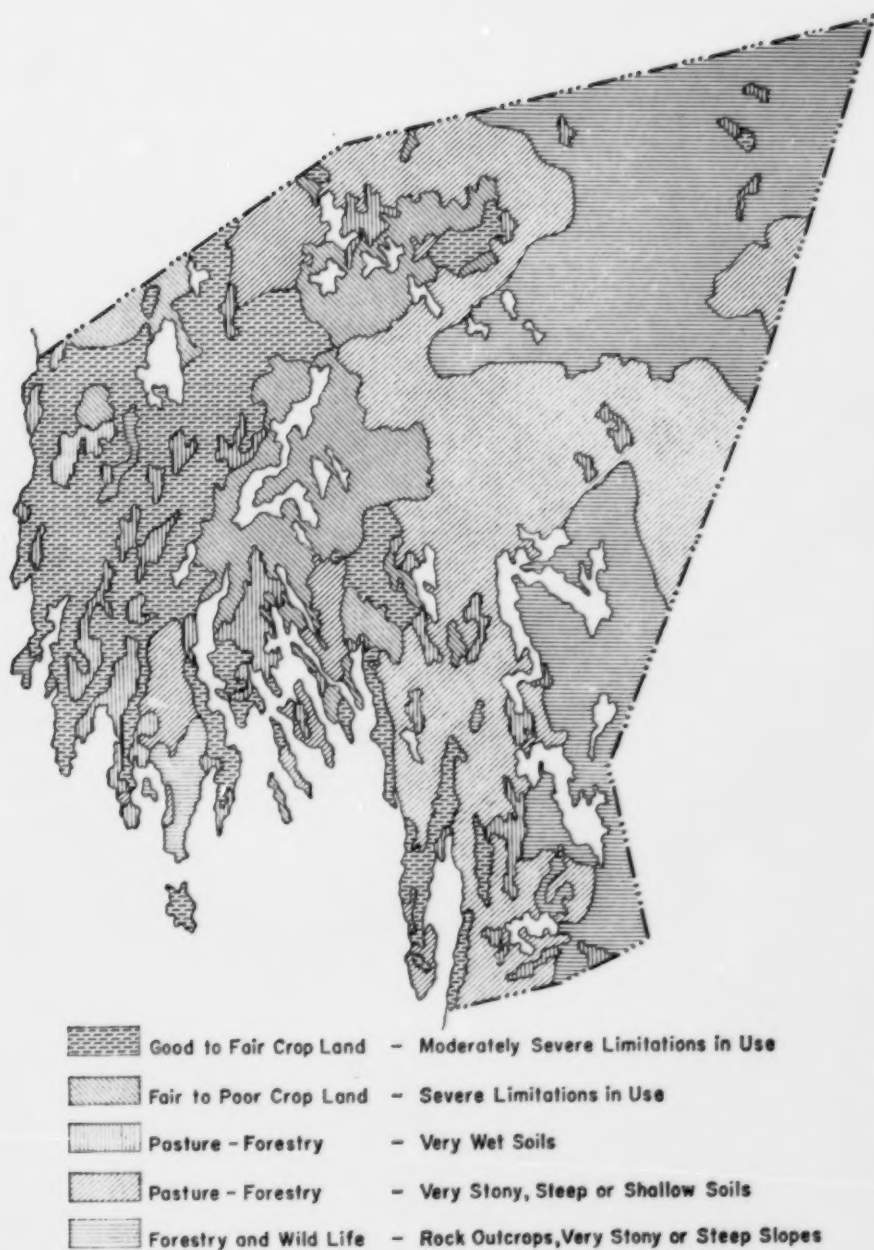


Figure 5. Land-use capability classes, Yarmouth County.

Descriptions of the Soils

Soils developed from glacial till occupy about 84 per cent of the County. About 97 per cent of these soils are developed from moderately coarse textured materials and the remainder from medium-textured materials. Roughly 70 per cent of the soils in this group are well drained to moderately well drained. All of the well-drained soils display the typical characteristics of Podzol soils, whereas in the imperfectly drained soils these characteristics are subdued by mottling and other effects of restricted drainage.

The soil and their characteristics are discussed in the following pages and each soil series is described in detail. The soil colors are described by names and symbols that correspond to matching colors found in the standard Munsell color chart. For example (10 YR 4/3) is the notation for the color dark brown, (5 YR 4/3) is reddish brown, and so on. The colors given are for soils in the moist state.

SOILS DEVELOPED FROM MEDIUM-TEXTURED GLACIAL TILL PARENT MATERIALS

The three soils of the Bridgewater catena are the only members of this group. The well-drained soils were mapped as the Bridgewater series, imperfectly drained soils as the Riverport series, and poorly drained soils as the Middlewood series.

The soils have developed from loam to sandy loam parent materials derived principally from slate. They occupy less than 7,000 acres in the County, of which 1,000 acres are poorly drained.

Bridgewater Series (3,488 acres)

The soils of this series occur in small, widely scattered areas of the County. They are found in areas of a few hundred acres in extent in the vicinity of Kemptville, Pubnico, Arcadia, and Norwood.

Topography ranges from gently to moderately undulating. In several areas, notably at Pubnico and Norwood, the undulating topography is due to the existence of numerous small drumlinoid mounds of till material. Between these mounds the soils are shallow to bedrock.

Drainage, both external and internal, is fairly rapid. It is only where bedrock comes close to the surface that internal drainage is poor. In these areas seepage spots may occur on the slopes and the soils may be droughty in dry seasons. The soils, where forested, support a good growth of hemlock, fir, white and red spruce, maple, birch, beech, and poplar. A Bridgewater soil profile is described below.

Horizon	Depth	Description
A ₀	2- 0 inches:	dark, brownish-black, fibrous organic matter; H layer thin, granular mor 2-3 inches thick; pH 3.5.
A ₂	0- 2 inches:	pinkish-gray (7.5 YR 6/2) silt loam; weakly developed crumb structure; friable; 1-3 inches thick; pH 3.7.
B ₂₁	2-13 inches:	strong-brown (7.5 YR 5/6) loam; medium crumb structure; friable; porous; 8-12 inches thick; pH 5.2.
B ₂₂	13-23 inches:	yellowish-brown (10 YR 5/4) loam; structureless; slightly firm; 8-12 inches thick; pH 5.2.
C	23— inches:	light-olive-gray (5 Y 6/2) shaly loam; firm; numerous fragments of dark-gray or black slate or phyllite; pH 5.2.

The A₂ horizon is usually thin and is sometimes absent. The B₂ horizon may rest on bedrock in the more shallow areas.

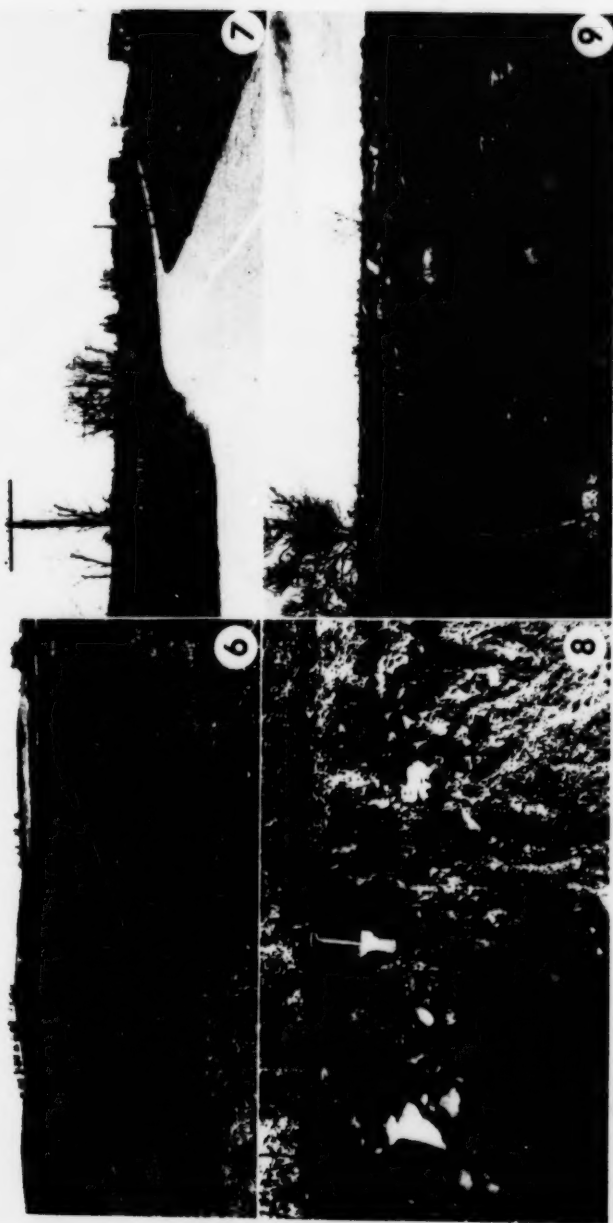


Figure 6. Soils of three series: Yarmouth soils occur on the low drumlins in the background, Chegoggin soils in the center, and Deerfield soils in the foreground. Figure 7. On Mersey sandy loam, farming is confined to low drumlins in the Argyle area. Figure 8. Soils of the Halifax series are moderately coarse textured and very stony. Figure 9. Large areas of Gibraltar soils support only a heath vegetation. Huge boulders and rock outcrops are dominant features of the landscape.



Figure 10. Neat stone fences are common in areas of soils of the Deerfield series. Figure 11. One of the better farms in the Yarmouth area, on Deerfield sandy loam. Figure 12. Pitman soils, poorly drained and stony, are unsuitable for agriculture. Figure 13. Medway gravel is used extensively as road-building material. Figure 14. When dyked and drained, salt marshes like these should be productive.

Utilization

The Bridgewater series is not important agriculturally in Yarmouth County. It occupies a relatively small total area at several widely scattered locations. Most of the Bridgewater soils in the County could be used to advantage, particularly for vegetable crops or potatoes. At present much of the area occupied by these soils is in forest.

Hay, grain, and potatoes are the principal crops grown on the Bridgewater soils. Rough cleared land is used for pasture, but is not very productive unless treated with lime and fertilizer. The soils are best suited to the growing of potatoes, vegetables, and small fruits, but good crops of hay and grain can be obtained.

Riverport Series (2,506 acres)

Soils of the Riverport series occupy gently undulating (up to 3% slope) to gently rolling (3 to 8% slope) topography in association with soils of the Danesville and Bayswater series. Drainage is restricted by the nature of the relief and by shallowness to bedrock. In many respects the soils are similar to those of the Bridgewater series, but are darker colored in the lower subsoil and show marked evidence of mottling, particularly in the lower B horizon. These soils often occur where bedrock is near the surface and prevents the downward movement of water.

A large proportion of the Riverport soils are under forest vegetation. They support excellent stands of red and white spruce, red maple, hemlock, fir, poplar, and wire birch. A typical Riverport sandy loam profile is described below.

Horizon	Depth	Description
A ₀	4- 0 inches:	dark-brown, fibrous, poorly decomposed organic matter; 3-5 inches thick; pH 3.6.
A ₂	0- 2 inches:	light-gray (10 YR 7/1) sandy loam; porous; friable; weakly developed crumb structure; 2-4 inches thick; pH 3.5.
B ₂₁	2- 7 inches:	dark-brown (7.5 YR 4/4) sandy loam; fine crumb structure; friable; faintly mottled; 4-8 inches thick; pH 4.5.
B ₂₂	7-15 inches:	strong-brown (7.5 YR 5/6) sandy loam; weakly developed subangular blocky structure; strongly mottled with light-gray mottling; containing slate and shale fragments; 6-10 inches thick; pH 4.8.
C	15+ inches:	light-olive (2.5 Y 5/4) shaly loam; compact; containing numerous small shale and slate fragments; pH 5.1.

The A₀ horizon is usually thicker in the Riverport than in the Bridgewater soils. Mottling occurs throughout the profile, but is most pronounced in the lower B horizon. The parent material varies in color from yellowish-brown to olive and in some areas is very dark colored because of weathering of black or gray slate fragments.

Utilization

The soils of the Riverport series occupy only a small area in the County and are not important agriculturally for that reason. They are suited to the growing of most crops, particularly small fruits and vegetables. Shallowness and stoniness are factors limiting their agricultural value, but cleared areas are being farmed with good results.

Middlewood Series (832 acres)

The soils of the Middlewood series occur as scattered areas on depressional to gently undulating topography, in association with the Bridgewater and Riverport soils. Drainage ranges from poor to very poor as a result of topography or depth to bedrock. The soils are nearly all covered with forest consisting of red spruce, red maple, black spruce, tamarack, and alder. A profile description of the Middlewood sandy loam is given below.

<i>Horizon</i>	<i>Depth</i>	<i>Description</i>
A ₀	5- 0 inches:	dark-brown, poorly decomposed organic material; 3-7 inches thick; pH 3.5.
A _{2K}	0- 4 inches:	gray (5 Y 6/1) sandy loam, structureless; slightly firm; mottled with brown mottles; 3-8 inches thick, pH 3.6.
B _{2K}	4- 8 inches:	light-olive-gray (5 Y 6/2) to yellowish-brown (10 YR 5/6) sandy loam; mottled; structureless; firm; numerous slate fragments; 3-6 inches thick; pH 4.2.
B ₃	8-14 inches:	dark-yellowish-brown (10 YR 4/4) slaty loam; structureless; firm; strongly mottled; 4-8 inches thick; pH 4.8.
C	+14 inches:	olive (2.5 Y 4/4) slaty loam; compact; pH 5.0.

In some areas the B horizon rests on bedrock at a depth of 10-15 inches. In very poorly drained positions there is a thick muck or peat layer overlying a firm subsoil. Water percolation is slow through this subsoil and in many places is held near the surface by the underlying bedrock.

Utilization

The Middlewood soils are unsuited to agriculture and should be left in forest. Areas too small to map have been included with the Bridgewater and Riverport series.

SOILS DEVELOPED FROM MODERATELY COARSE-TEXTURED
GLACIAL TILL PARENT MATERIALS

The soils of four catenas are included in this group. The well-drained soils are the Yarmouth, Mersey, Halifax and Gibraltar series; imperfectly drained are the Danesville, Liverpool, Deerfield and Bayswater, and poorly drained are the Aspotogan and Pitman series.

The Yarmouth, Mersey, Liverpool, Deerfield and Pitman soils have developed from parent materials derived primarily from schist. Local variations occur where granite or quartzite materials make up a significant proportion of the drift. Coarser-textured tills and stonier soils are usually encountered in these areas.

The Halifax and Danesville series have developed on materials derived principally from quartzite. Gibraltar, Bayswater and Aspotogan have developed on till derived from granite. The poorly drained member of the Halifax catena is included with the Aspotogan series.

Soils developed on moderately coarse textured tills occupy approximately 464,726 acres, or 81 per cent, of the County. About 12 per cent of this area is poorly drained.

Yarmouth Series (31,405 acres)

The soils of the Yarmouth series occupy strongly undulating topography along the coast and moderately undulating to rolling topography farther inland. They are associated on the landscape with the Mersey series and differ from them in the compact nature of the subsoil. Drainage is fairly rapid on the surface but internal drainage is restricted, so that, in general, the soils are only moderately well drained. With rapid surface runoff, poor internal drainage does not seriously interfere with agricultural use. In the drumlin area north of Yarmouth, small areas of poorly drained soils are included with the Yarmouth series. These areas were too small to separate from the Yarmouth series on the scale of mapping used.

The parent material of the Yarmouth series is derived largely from mica and hornblende schists. Some quartzite may be found in the till, but this does not seem to have influenced profile development to any marked degree. Where forested, the Yarmouth soils support a good growth of spruce, fir, birch, maple, and poplar. A description of the Yarmouth soil profile under forest vegetation is given below.

<i>Horizon</i>	<i>Depth</i>	<i>Description</i>
A ₀	3- 0 inches:	dark-brown semi-decomposed organic matter; F layer fibrous and felty; H layer granular mor; 2-4 inches thick; pH 3.5.
A ₂	0- 2 inches:	light-gray (2.5 Y 7/2) sandy loam; weakly developed fine crumb structure; friable; 0-3 inches thick; pH 3.7.
B ₂₁	2- 8 inches:	dark-brown (7.5 YR 4/4) sandy loam; fine crumb structure; friable; 4-10 inches thick; pH 4.9.
B ₂₂	8-16 inches:	strong-brown (7.5 YR 5/6) sandy loam; moderately firm; readily crushed to fine granular structure; 6-10 inches thick; pH 5.2.
C	—16 inches:	light-yellowish-brown (2.5 Y 6/4) sandy loam; compact; numerous schist fragments; pH 5.3.

The cultivated layer is a dark grayish-brown sandy loam to loam. It is usually high in organic matter and has a well-developed medium-granular structure. The A₂ horizon is frequently absent or poorly developed, particularly on drumlin areas.

Utilization

Soils of the Yarmouth series are used extensively for agriculture in the area between Port Maitland and Chebogue. Together with the soils of the Deerfield series they make up much of the agricultural land of the County. Under natural conditions some areas are stony. The stones have been removed from cultivated fields and now serve a useful purpose in stone fences.

Mixed farming is the general practice on the Yarmouth soils, but the accent is on dairying. A considerable acreage is devoted to truck and root crops for the local market. Carrots, beets, beans, peas, turnips, and potatoes, as well as small fruits, all grow well when the soils are properly managed. The soils are very acid and for good production of legumes and most other crops, applications of lime are necessary. In the past, the difficulty of curing has discouraged farmers in the area from growing legumes for hay, but production of legumes for grass silage should be encouraged. The climate and the soils make the area very suitable for the production of grasses and legumes. A sound management program, including lime and commercial fertilizers, with the necessary precautions to guard against erosion, should make these soils as productive as any upland soils in the Province.

Mersey Series (22,523 acres)

These soils occupy slightly less than 4 per cent of the surveyed area. They are found on moderately undulating to rolling topography and are confined largely to the extreme northern and southern parts of the County. In the southern part there are numerous drumlins varying in height from 50 to 100 feet on which these soils have developed. On these drumlins the slopes range from 5 to 25 per cent. The soils are well drained, partly because of topography but largely because of the porous nature of the subsoil.

Mersey soils are capable of supporting good forest growth. The tree cover consists of pine, spruce, maple, beech, poplar, and oak. Some areas support a heath vegetation of lambkill, huckleberry, sweet fern and blueberry. New forest growth is slowly encroaching from the edges of the burns and consists chiefly of poplar and wire birch. A typical Mersey sandy loam profile is described below.

Horizon	Depth	Description
A ₀	3- 0 inches:	black semi-decomposed organic matter; F layer thick; H layer very thin; 2-4 inches thick; pH 3.6.
A ₂	0- 2 inches:	gray (10 YR 6/1) sandy loam; weakly developed platy structure; friable; 1-3 inches thick; pH 3.7.
B ₂₁	2- 5 inches:	strong-brown (7.5 YR 5/8) sandy loam; fine crumb structure; friable; 6-10 inches thick; pH 5.0.
B ₂₂	5-14 inches:	yellowish-brown (10 YR 5/8) sandy loam; fine crumb structure; friable; 6-10 inches thick; pH 5.0.
B ₃	17-22 inches:	light-olive (2.5 Y 5/4) sandy loam; slightly firm; 3-6 inches thick; pH 5.2.
C	22+ inches:	olive-gray (5 Y 5/2) sandy loam; firm but porous; numerous fragments of schist; pH 5.4.

The Mersey soils in this area are somewhat coarser textured than those found in Queens County. The dominant texture of the surface soil is sandy loam, though silt loam is found in a few locations. In some respects Mersey soils resemble Halifax soils and are associated with them on the landscape. They differ in geological origin and depth of profile development. The Halifax soils have a gritty feel between the fingers, whereas the Mersey soils are smooth-textured, loose and mellow. Drainage is nearly always better on the Mersey soils than on Halifax soils on similar topography. There is seldom any compaction of the Mersey parent material. This allows for ready percolation of drainage water on normal relief.

Utilization

Some farming is done on the Mersey soils of Yarmouth County, but is confined almost entirely to the drumlin areas around Argyle and through the Pubnicos. Elsewhere the soils are too stony to permit ready clearing and cultivation. In the areas now cleared, general farming is practiced and some good crops of hay, grain, roots, and vegetables were noted. A wide range of vegetable crops and small fruits could be grown on these soils. The fire burns are well suited to blueberry production and more attention could be given to the commercial development of this crop.

Halifax Series (157,491 acres)

Soils of the Halifax series occupy approximately 27.5 per cent of the County area and occur on undulating topography similar to that occupied by the Mersey and Gibraltar soils. Small drumlinlike mounds frequently occur,

but these are smaller and not so well formed as those found on the Mersey soil areas. Drainage is fairly rapid except in coastal areas, where firmness of the parent material slows the percolation of drainage water.

Most of the Halifax soils are useless for agriculture because of extreme stoniness. Areas less stony than average occur around Carleton and Kemptville. Other small areas have been cleared and are being farmed, but the total area under cultivation is small.

Large areas occupied by the Halifax soils have been burned over. At present the fire barrens are covered with vegetation consisting chiefly of fern, lambkill, blueberry, wire birch, and some maple. Forested areas support a good growth of red and white spruce, pine, white birch, maple, and oak. A description is given below of Halifax sandy loam as found under forest vegetation.

Horizon	Depth	Description
A ₀	3- 0 inches:	dark-gray (10 YR 4/1) semi-decomposed organic matter; fibrous; 2-4 inches thick; pH 3.6.
A ₂	0- 2 inches:	light-brownish-gray (10 YR 6/2) sandy loam; structureless; friable; 1-14 inches thick; pH 3.8.
B ₂₁	2-10 inches:	yellowish-brown (10 YR 5/8) sandy loam; medium crumb structure; porous, gritty; 4-10 inches thick; pH 4.6.
B ₂₂	10-18 inches:	yellowish-brown (10 YR 5/4) sandy loam; weakly developed fine crumb structure; porous; gritty; 6-12 inches thick; pH 5.0.
C	18+ inches:	light-olive (2.5 Y 5/4) sandy loam; loose and porous; numerous angular fragments of quartzite; pH 5.2.

Over most of the area the surface soil is coarse sandy loam overlying a sandy loam to gravelly sandy loam subsoil. Somewhat finer textures occur in the Carleton area. Where Halifax soils occur adjacent to soils of the Gibraltar catena, they are more stony than normal because of the presence of granite erratics. The subsoil becomes more gritty and coarser as the influence of the granite becomes more pronounced. There is no sharply defined boundary between the Halifax and Gibraltar soils in these areas.

Utilization

Approximately 95 per cent of the Halifax soils in Yarmouth County are unsuitable for agriculture and should be used for forest or possibly for production of blueberries in favorable locations. The remaining 5 per cent are fairly good to poor agricultural land, depending largely on how completely the stones have been removed. Areas still in forest are too stony to be cleared economically under present conditions.

Where the Halifax soils have been cleared, they are capable of producing good crops of hay, grain, roots and vegetables under proper management. The soils are low in natural fertility and are very acid. An adequate program of liming with maintenance of organic-matter content and the wise use of commercial fertilizers will enable the farmer to grow good crops on these soils.

Gibraltar Series (114,844 acres)

The soils of this series, covering about 20 per cent of the total area of the County, rank second in extent to the Halifax series. They are found in three separate areas: one in the northeastern corner of the County, a larger area in the southeast, and a small area south of Wedgeport. The relief is gently

undulating to rolling. Boulders and rock outcrops are dominant features and are most noticeable on the extensive fire barrens. Granite boulders 8 to 15 feet in diameter are not uncommon. On the fire barrens the principal vegetation is blueberry, crowberry, sweet fern, and lambkill. Some of the barrens are slowly reseeding to wire birch, pine, and poplar. Wooded areas support a good growth of pine, fir, spruce, hemlock, birch, and maple. A representative profile of Gibraltar sandy loam as found under forest vegetation is described below.

Horizon	Depth	Description
A ₀	3- 0 inches:	very dark grayish-brown (10 YR 3/2) semi-decomposed organic matter; 2-5 inches thick; pH 3.7.
A ₂	0- 3 inches:	light-brownish-gray (10 YR 6/2) sandy loam; structureless; loose; friable; 1-4 inches thick; pH 4.0.
B ₂₁	3- 8 inches:	dark-brown (7.5 YR 3/2) sandy loam; fine crumb structure; friable; 3-8 inches thick; pH 4.4.
B ₂₂	8-17 inches:	strong-brown (7.5 YR 5/6) sandy loam; structureless; firm; 6-12 inches thick; pH 4.6.
B ₃	17-23 inches:	yellowish-brown (10 YR 5/4) sandy loam; structureless; firm; some stone; 5-10 inches thick; pH 4.6.
C	23+ inches:	light-brownish-gray (10 YR 6/2) gravelly sandy loam; loose; porous; very stony; pH 4.8.

Gibraltar soils near the coast have a thicker A₀ horizon and are more strongly podzolized than those inland, and have some cementing in the B₂ horizon.

Utilization

There are no Gibraltar soils suitable for agriculture. Some of the fire barrens could be used for the production of blueberries, which grow well on the acid soil. Large areas of fire barrens could be reforested and an effort should be made to establish and maintain a good forest growth on these soils. This can only be done through controlled cutting and the prevention of forest fires.

Deerfield Series (18,976 acres)

Deerfield soils are confined to gently rolling areas and long slopes in association with the Yarmouth series. The compact nature of the subsoil and, in some areas, shallowness to bedrock, produce numerous seepage spots on the slopes. Imperfect drainage in cleared fields is evidenced by sedges growing on the wet spots. Surface textures range from sandy loam to loam with sandy loam to silt loam subsoil and parent material. In cleared areas the soils are not excessively stony but have more stone on the surface than the drumlin areas of the Yarmouth series. Some areas still in forest or rough pasture are very stony and are not suited to agriculture.

Where forested, the soils support a good growth of spruce, fir, red maple, and birch. Large areas have been cleared and are under cultivation. A description of Deerfield sandy loam under forest vegetation is given below.

Horizon	Depth	Description
A ₀	4- 0 inches:	dark-brown semi-decomposed organic matter; F layer thick, fibrous; H layer thin, granular mor; 3-6 inches thick; pH 3.6.

- A₂ 3- 0 inches: gray (10 YR 6/1) silt loam; structureless; infiltrated with organic matter in upper inch; 2-4 inches thick; pH 3.8.
- B₂₁ 3- 6 inches: dark-brown (10 YR 4/3) sandy loam; iron cemented; strong-brown mottles; 2-5 inches thick; pH 4.7.
- B₂₂ 6-16 inches: olive (5 Y 5/3) sandy loam; firm, mottled with yellowish-brown mottles; micaceous; 8-12 inches thick; pH 5.0.
- C 16+ inches: olive-gray (5 Y 5/2) sandy loam; compact; numerous fragments of schist and some quartzite; pH 5.0.

The cultivated layer is silt loam to sandy loam in texture and dark grayish brown in color. The organic-matter content is high, particularly in areas near the coast. Farther inland there is a significant decrease in surface organic matter. A firm B₂ horizon is characteristic of the Deerfield soils, but this feature is not so marked several miles inland from the coast. The subsoil is firm and rests upon a compact, somewhat impervious parent material.

Utilization

Deerfield soils are used extensively for agriculture in the area between Chebogue and Lake George. They are better suited to the use of heavy machinery than the Yarmouth soils, since the slopes are smoother and the topography less hummocky. Both mixed farming and dairying are carried on, with some acreage devoted to vegetables, roots and potatoes. Strawberries are the major small fruit grown in the area. The soils are well suited to grain, hay and pasture production and produce good crops under proper management. The use of tile drainage in some areas should be encouraged. Erosion on the long slopes could be serious under intensive clean cultivation. However, at the present time, most of the long slopes are in grass and erosion is not a problem.

Liverpool Series (26,442 acres)

The Liverpool soils occur on gently undulating to gently rolling topography, mainly in the southern half of the County. The series was first mapped in Queens County and is found in Shelburne and Digby counties as well.

Imperfect drainage is caused by such factors as shallowness to bedrock, topography and, in some cases, compaction of the subsoil. The soils are very stony and, except for small areas a few acres in extent, are not suited to agriculture. They support a good growth of forest vegetation, chiefly spruce, maple, wire birch, and fir. Burned-over areas have lambkill, blueberry, sweet fern, and sphagnum moss as the chief vegetation. New forest growth on the latter areas consists chiefly of wire birch, maple, and poplar.

A profile description of the Liverpool sandy loam is given below.

Horizon	Depth	Description
A ₀	4- 0 inches:	dark brownish-black, partly decomposed organic matter; F layer fibrous; H layer fairly thick, greasy mor; 3-5 inches thick; pH 3.8.
A ₂	0- 2 inches:	gray (10 YR 6/1) sandy loam; structureless, slightly firm; porous; 2-4 inches thick; pH 3.8.
B ₂	2- 8 inches:	brown (10 YR 5/3) sandy loam; medium crumb structure; friable; mottled; 6-10 inches thick; pH 4.8.

- B₃ 8-18 inches: olive (5 Y 5/3) sandy loam; structureless; slightly firm; mottled with strong brown mottles; numerous small stone fragments; 6-12 inches thick; pH 5.0.
- C 18+ inches: pale olive (5 Y 6/3) sandy loam; moderately firm; contains numerous small fragments of schist and some quartzite; pH 5.4.

The cultivated surface soil ranges in texture from sandy loam to loam and is dark grayish brown in color. Under cultivation this topsoil develops a granular structure. Underlying the surface soil is a brown to yellowish-brown friable B₂ horizon, which grades into an olive B₃ horizon. The B₂ horizon is weakly mottled with strong brown mottles and is slightly firm in place.

Utilization

Practically all of the Liverpool series is either in forest or barren. Only a few areas are cultivated and these occur in the southwest coastal region on drumlins. In this area, high humidity and rainfall tend to produce the same profile characteristics in drumlin soils as are found on more level topography farther inland. Where the soils are farmed, some good crops of hay, grain and roots are produced. The soils are responsive to good management and fertility practices. Excessive stoniness is the principal factor limiting their development for agriculture.

Danesville series (30,034 acres)

The Danesville series occurs on undulating topography and forms an intricate pattern on the landscape with the well-drained Halifax and the poorly drained Aspotogan soils. In coastal areas Danesville soils may be found on moderately undulating to gently rolling topography. The soils are imperfectly drained and frequently have a cemented B₂ horizon that restricts the downward movement of water.

These soils are very stony and, except for a few small areas, are still in forest. They support a good growth of red maple, spruce, poplar, fir, and yellow birch. A profile description of Danesville sandy loam is given below.

Horizon	Depth	Description
A ₀	3- 0 inches:	dark-brownish-black, partly decomposed organic matter; F layer thin; H layer thick, granular mor; 2-5 inches thick; pH 3.6.
A ₂	0- 3 inches:	pinkish-gray (5 YR 6/2) sandy loam; weakly developed platy structure; friable; faintly mottled; 2-6 inches thick; pH 3.8.
B ₂₁	3- 6 inches:	brown (7.5 YR 4/4) sandy loam; fine crumb structure; friable; numerous roots; 2-6 inches thick; pH 4.4.
B ₂₂	6-12 inches:	strong-brown (7.5 YR 5/6) sandy loam; structureless; firm; mottled with yellowish-brown mottles; 3-8 inches thick; pH 4.8.
B ₃	12-18 inches:	yellowish-brown (10 YR 5/4) sandy loam; structureless; firm; mottled with brown to yellowish-brown mottles; 5-10 inches thick; pH 5.0.
C	18- inches:	light-olive (2.5 Y 5/4) sandy loam; firm; gritty; numerous fragments of quartzite and some slate; pH 5.2.

Danesville soils near the coast have a high organic-matter content in the cultivated layer and are weakly cemented in the B₂ horizon. Away from the coastal influence there is a marked decrease in humus content of cultivated soils and less cementing in the B horizon.

Utilization

Danesville soils are not generally suited to agriculture; most of the areas in Yarmouth County are excessively stony and large boulders and rock outcrops are common. Some small areas in the north have been cleared and these produce good crops of hay, grain and roots under proper management. The soils are too stony for economic development as farm land, however, and further clearing of wooded areas should be discouraged.

Bayswater Series (8,648 acres)

Bayswater soils occur on gently undulating topography in association with the Gibraltar and Aspotogan series. They are very stony and, like the other members of the Gibraltar catena, have a large number of boulders scattered over the surface. The soils support a good growth of hemlock, red maple, red spruce, and wire birch on the better drained positions. With progressively poorer drainage, black spruce, red maple, and wire birch dominate the forest vegetation.

A Bayswater sandy loam profile is described below.

Horizon	Depth	Description
A ₀	4- 0 inches:	dark-brown to black semi-decomposed organic matter; F layer fibrous; H layer thick, granular mor; 3-8 inches thick; pH 3.6.
A ₂	0- 4 inches:	light-gray (10 YR 7/1) sandy loam; structureless; friable; 2-5 inches thick; pH 4.0.
B ₂₁	4- 8 inches:	brown (10 YR 5/3) sandy loam; weakly developed fine crumb structure; friable; porous; 3-6 inches thick; pH 4.4.
B ₂₂	8-16 inches:	yellowish-brown (10 YR 5/6) sandy loam; weakly cemented; mottled with yellowish-brown to brown mottles; 5-10 inches thick; pH 4.8.
B ₃	16-22 inches:	yellowish-brown (10 YR 5/4) sandy loam; structureless; firm; mottled with brown to grayish-brown mottles; 5-10 inches thick; pH 4.8.
C	22+ inches:	very pale-brown (10 YR 7/3) coarse sandy loam; firm; very stony; pH 5.0.

The cultivated layer is very dark grayish-brown (10 YR 3/2) sandy loam and has a well-developed granular structure. The upper B horizon is a brown friable sandy loam with little or no mottling. The B₂₂ is distinctly mottled and often cemented. The B₃ horizon is strongly mottled and grades very gradually into the brownish-gray to pale-brown parent material.

Utilization

The Bayswater soils are too stony for agriculture and should remain in forest. At present there are only a few acres that have been cleared and developed to any extent. These areas are of some value as rough pasture or small garden plots.

Pitman Series (21,698 acres)

Soils of the Pitman series are found on gently undulating to depressional sites associated with the Yarmouth, Deerfield, Mersey and Liverpool series. Drainage ranges from poor to very poor. Internal drainage is restricted by the compact nature of the parent material, by shallowness over bedrock or by relief.

Vegetation usually consists of black and red spruce, red maple, tamarack, and alder. Very poorly drained areas have a vegetative cover of stunted black spruce, tamarack, sphagnum moss, and sedges. Some small areas of these soils are included with the Yarmouth, Deerfield, Mersey and Liverpool series where the drainage pattern is so complex as to prohibit separation on the scale of mapping used.

A representative soil profile of Pitman sandy loam under forest vegetation is given below.

Horizon	Depth	Description
A ₀	7- 0 inches:	dark-brown to black, fairly well decomposed organic matter; F layer felty; H layer black, greasy mor; 4-10 inches thick; pH 3.6.
A _{2x}	0- 6 inches:	gray (5 YR 5/1) sandy loam; structureless; slightly firm; mottled with distinct, light-brown mottles; 3-8 inches thick; pH 3.8.
B _{2x}	6-10 inches:	dark-brown (7.5 YR 3/2) sandy loam; medium subangular blocky structure; mottled; aggregates cemented with organic matter and iron; 2-6 inches thick; pH 4.4.
B ₃	10-17 inches:	olive (5 Y 5/3) sandy loam; firm; mottled with strong-brown (7.5 YR 5/8) mottles; 5-10 inches thick; pH 4.8.
C	17+ inches:	light-olive-gray (5 Y 6/2) sandy loam; compact; mottled; numerous small fragments of schist and some quartzite; pH 5.0.

In some areas the surface soil is a well-decomposed muck underlain by a thick, mottled A₂ grading sharply into a firm and often cemented B horizon. The boundary between the lower B horizon and the parent material is sharply defined. The water table in these soils is near the surface a large part of the year.

Utilization

Pitman soils are unsuitable for agriculture. Some small areas have been cleared and appear as wet spots in fields and pastures. The better drained areas produce good forest growth.

Aspotogan Series (32,665 acres)

Soils of this series occur on depressional to nearly level areas in association with the Halifax, Gibraltar, Danesville, and Bayswater soils. Drainage, both external and internal, is slow, largely because of topography. The soils are characterized by a fairly deep organic layer and in places the sites resemble peat bogs. Shallow peaty deposits cover a coarse-textured strongly mottled subsoil. Vegetation on the better-drained areas consists of red maple, red spruce, and hemlock. Black spruce, tamarack, and sphagnum moss are found on the very poorly drained soils. A description of Aspotogan sandy loam is given below.

Horizon	Depth	Description
A ₀	6- 0 inches:	dark-gray, moderately well decomposed organic matter; F layer thick, fibrous; H layer black, greasy mor; 4-10 inches thick; pH 3.8.

- A_{2s} 0- 4 inches: light-olive-gray (5 Y 6/2) sandy loam; structureless; mottled with brown mottles; 3-8 inches thick; pH 4.0.
- B_{2s} 4- 9 inches: dark-brown (10 YR 4/3) sandy loam; firm; strongly mottled; 3-8 inches thick; pH 4.4.
- B₃ 9-15 inches: yellowish-brown (10 YR 5/4) sandy loam; firm; strongly mottled; 4-10 inches thick; pH 4.8.
- C 15+ inches: light-brownish-gray (2.5 Y 6/2) gravelly sandy loam; firm; pH 5.0.

The B₃ horizon is often thin or absent in the very poorly drained positions and the B₂ rests on firm, moderately coarse-textured parent material.

Utilization

Aspotogan soils are not suitable for agriculture because of excessive stoniness and poor drainage. Many areas are so poorly drained that they will not support vegetation other than stunted black spruce, tamarack, mosses, and sedges.

SOILS DEVELOPED FROM COARSE-TEXTURED, STRATIFIED PARENT MATERIALS

This group of well-drained soils includes two series developed from glacio-fluvial materials deposited during the last glacial period. These deposits are in the forms of kames, eskers and outwash plains and are widely scattered over the surveyed area.

Soils of the Medway series have developed from parent materials derived principally from quartzite and schist and the La Have soils have developed from parent materials derived from slate.

Medway Series (11,424 acres)

The larger areas of Medway soils occur around Wedgeport and the Pubnicos, but small scattered areas are found throughout the County. The parent material is a gray to grayish-brown gravelly sandy loam derived principally from quartzite, with some schist and granite. Drainage is good to excessive over most of the area. A fair proportion of the Medway soils are used for agriculture since in many areas they are less stony than the adjacent soils. Where forested they support a fairly good growth of spruce, pine, birch, and maple.

A description of a typical Medway sandy loam is given below.

Horizon	Depth	Description
A ₀	3- 0 inches:	very dark-brown (10 YR 2/2) semi-decomposed organic matter; H layer granular mor; 2-5 inches thick; pH 3.2.
A ₂	0- 2 inches:	light-gray (10 YR 7/2) sandy loam; weakly developed crumb structure; friable; 1-5 inches thick; pH 4.0.
B ₂	2- 9 inches:	dark-brown (10 YR 4/3) sandy loam; weakly cemented; 4-10 inches thick; pH 5.5.
B ₃	9-20 inches:	light-olive (2.5 Y 5/4) gravelly sandy loam; firm; 5-14 inches thick; pH 5.5.
C	20+ inches:	grayish-brown (2.5 Y 5/2) gravel; weakly cemented in upper part; loose and unconsolidated at greater depth; largely quartzite with some schist and granite; pH 5.5.

The cultivated layer is a dark-brown to dark-grayish-brown sandy loam to gravelly sandy loam. It is loose and fairly friable and has a well-developed granular structure. Some cementation is usually found in the B₂ horizon. The parent material ranges in color from grayish-brown to gray and is very gravelly.

Utilization

Medway soils in the Tusket and Wedgeport area are used for farming and small gardens. The soils are fairly well suited to the growing of vegetables and strawberries. In the coastal areas where the soils are farmed there is a relatively high organic-matter content and the moisture-holding capacity is fairly good. Most of the cleared areas are not excessively stony; other areas, particularly east of Pubnico, are too stony to be cleared and farmed economically. Where better soils are available the Medway soils should be left to forest.

La Have Series (1,920 acres)

These soils have been developed on slaty water-deposited materials in the area between Pubnico and Lower West Pubnico. They are found on nearly level to moderately undulating topography, and drainage is good to excessive throughout. Nearly all the area has been cleared or burned over. Areas not cultivated support a blueberry—heath vegetation with scattered pine, spruce, and white birch.

A profile description of the La Have sandy loam is given below.

Horizon	Depth	Description
A ₀	3- 0 inches:	black organic layer, fairly well decomposed; H layer fine crumb to granular mor; 2-4 inches thick; pH 3.6.
A ₂	0- 2 inches:	light-brownish-gray (2.5 Y 6/2) sandy loam; structureless; friable; 0-4 inches thick; pH 3.8.
B ₂	2-10 inches:	yellowish-brown (10 YR 5/8) gravelly sandy loam; weakly developed fine crumb structure; friable; numerous slate fragments; 4-10 inches thick; pH 5.0.
B ₃	10-17 inches:	grayish-brown (10 YR 5/2) gravelly sandy loam; structureless; porous; numerous slate fragments; 4-10 inches thick; pH 5.4.
C	17+ inches:	slaty gravel; stratified and well sorted; loose and porous.

The cultivated layer is dark grayish brown in color and has a well-developed granular structure. The B horizon is fairly friable, but has a high proportion of slate fragments. In some areas the lower B horizon is weakly cemented and is clearly stratified.

Utilization

Most of the La Have soils in the County are cleared and used for general farming, gardens, pasture or blueberries. The soils are relatively free of large stones and boulders and are easily cleared. Though naturally of low fertility and high acidity, they have been built up by applications of seaweed to form productive agricultural soils. They tend to be droughty in dry seasons and for this reason careful attention should be given to maintenance of organic matter. Lime and fertilizer should be applied to increase production. However, soils intended for potatoes should not be limed too heavily, pH 5.4 being the upper limit.

SOILS DEVELOPED FROM MEDIUM-TEXTURED ALLUVIAL MATERIALS

Cheggoggin Series (723 acres)

Soils of this poorly drained series occur on two dyked areas near Cheggoggin and have developed on recent fluvio-marine deposits of medium-textured sediments. They differ markedly from the soils of the Acadia catena, which were formed on fluvio-marine deposits of the Bay of Fundy. In the Yarmouth area the silty deposits were formed slowly, permitting the growth of salt-tolerant vegetation. This resulted in the formation of a deposit high in organic matter and dark grayish brown in color rather than the reddish-brown color so characteristic of the Acadia soils. In addition, the marshland soils in Yarmouth County contain numerous shells of marine origin.

The Cheggoggin soils are similar to the soils in areas shown as salt marsh. They differ in that they have been partially or completely protected from salt water flooding for some time, with consequent lowering of salinity and some apparent leaching of the surface layer. The areas mapped are poorly drained and the water table remains near the surface throughout much of the year. Vegetation consists of "broadleaf", sedges, fox grass, black grass and some browntop and couch grass.

A description of the Cheggoggin silt loam is given below.

Depth	Description
0- 2 inches:	dark-brown, well-decomposed and mineralized organic matter; numerous roots of sedge and grasses; pH 4.6.
2-10 inches:	dark-grayish-brown (10 YR 4/2) silt loam; granular structure; porous; mottled with dark-brown mottles; numerous roots; pH 5.4.
10-30 inches:	olive-gray (5 Y 5/2) silt loam; structureless; plastic when wet; numerous fragments of partially decomposed sedges; mottled with distinct gray mottles and brown patches; pH 6.4.

In some areas the mineralized organic layer on the surface reaches a depth of 5 to 6 inches, seldom more. The lower subsoil resembles in color the material from which the surrounding upland soils have developed. It is stone-free and contains very little coarse sand.

Utilization

The Cheggoggin soils are of little agricultural value in their present condition. Artificial drainage and maintenance of dykes would greatly improve their value. The chief factor limiting development is the elevation above mean sea level. This elevation is less than ten feet at the upper end of the Cheggoggin dyked area. Should drainage be feasible from an engineering standpoint the soils are potentially productive, particularly for grain, hay and legumes. At present their use is limited to growing low-quality hay.

SOILS DEVELOPED FROM ORGANIC MATERIALS

Organic soils cover 23,219 acres, or 4.05 per cent of the County. They occupy level to depressional topography along stream channels and filled-in lake beds. The deposits have been divided into two classes based on the type of vegetation from which they were formed: sedge peat, a fairly well decomposed mineralized deposit; and sphagnum peat or raw peat composed chiefly of poorly decomposed sphagnum moss.

Sedge Peat (6,061 acres)

Areas of this soil occur along slow-flowing streams. The vegetation consists chiefly of sedges and coarse swamp grasses. The surface 8 to 16 inches is poorly decomposed organic material, black or dark brown in color, and made up of sedges, grass roots and some sphagnum moss. Underlying the surface layer is 1 to 6 feet of fairly well decomposed organic sediments. These deposits are saturated with water throughout the year and are often very soft and boggy.

Utilization

A few small areas of sedge peat in the County are sufficiently firm in summer to support light machinery and are used for hay production. Most of the areas are too wet to be utilized even for this purpose.

Sphagnum Peat (17,158 acres)

Numerous small deposits of this soil are found throughout the County. Like sedge peat, it occupies level to depressional topography or very poorly drained sites where organic matter has been deposited to a depth of a foot or more. Usually the sphagnum peat bogs occupy old lake beds that have filled in or are filling with organic sediments. These sediments consist of semi-decomposed peat formed from sphagnum moss and sedges. In some areas, stunted black spruce and tamarack grow on the deposits or around the edges. Usually there is little or no forest vegetation.

Utilization

While these peat bogs have no value either for agriculture or for forestry at present, some extensive areas have been investigated as potential sources of commercial peat moss or peat fuel.

MISCELLANEOUS SOILS

These soils occur on a total of 9,894 acres, or 1.73 per cent of the County. They include swamps, salt marshes and coastal beaches and have little or no agricultural value in their present condition. Some areas of salt marsh could be reclaimed and converted into valuable agricultural soils with dyking and drainage.

Swamp (1,101 acres)

Swamp soils occur on depressional topography under conditions of very poor drainage. The water table remains at or near the surface for most of the year. The surface layer is black or dark brown semi-decomposed organic matter 5 to 12 inches thick, overlying a gray or grayish-black mineral soil. This layer grades gradually into a strongly mottled, compact subsoil. The organic surface ranges from a black, well-decomposed muck to poorly decomposed sphagnum peat. Many of the areas resemble small peat bogs in external appearance but are shallow peat over mineral soil. Vegetation consists of black spruce, tamarack, sphagnum moss, and sedges, and in better areas spruce, maple, fir, and alder.

Utilization

The areas mapped as swamp are unsuitable for agriculture and should be left in their present state.

Salt Marsh (8,416 acres)

The areas of salt marsh have developed as a result of repeated salt-water flooding of low-lying coastal areas. Deposition of sediments at high tide has built up deep, medium-textured deposits along tidal stream channels and in

protected bays and inlets. The sediments deposited by tidal action in Yarmouth County are gray to olive in color and are a uniform silt loam in texture. The surface is covered with salt-tolerant vegetation, chiefly marsh grass, sea blite and spurrey.

Utilization

At present the salt marshes are of no value for agriculture. A number of areas in the County are under consideration for reclamation. If properly dyked and drained, the soils should be very fertile and productive.

Coastal Beach (378 acres)

There are a number of areas along the coastline where ridges of sand and gravel have been deposited by wave action. In some areas these deposits form sandy beaches; in others they form gravel bars protecting shallow bays and inlets. Since these deposits are constantly shifting and reforming, they do not develop a soil profile. Some fine beaches occur in the County and are important recreation spots. Summer homes, cottages and tourist accommodations are located near some of the better beaches.

AGRICULTURE AND LAND USE

Present Land Use

Much of Yarmouth County is still in forest or rough land. Only 13 per cent is occupied by farms and less than 3 per cent has been cleared for cultivation or rough pasture. There are 902 occupied farms in the County with an average size of 78 acres per farm.

TABLE V

DESCRIPTION AND ACREAGES OF OCCUPIED LAND—1956	
Total Land Area	518,733 acres
Area in Farms	70,548 acres
Number of Farms	902
<i>Improved</i>	12,717 acres
Field Crops	7,377 acres
Pasture	3,716 acres
Other	1,624 acres
<i>Unimproved</i>	57,831 acres
Woodland	28,892 acres
Other	28,939 acres

Approximately 85 per cent of the area in field crops is in hay (Table VI). Potatoes, occupying only 4 per cent of the field crop area, are second in importance; swedes and mangels occupy approximately 3 per cent and grain only 2 per cent. The hay grown consists largely of timothy and browntop with some clover. Grains grown are mainly oats and barley. A few acres of field beans were grown in 1956.

TABLE VI

ACREAGES IN FIELD CROPS IN YARMOUTH COUNTY—1956

	Acres
All field crops	7,377
Hay	6,265
Potatoes	257
Roots	178
Corn for fodder	59
Other fodder crops	508
Oats	85
Barley	20
Field beans	5

Roots and corn for fodder are produced mainly in the Port Maitland—Hebron—Chegoggin—Chebogue areas, which support much of the dairy industry in the County. Farmers have been hesitant about growing legumes for hay because of the difficulty of curing the hay in the moist, cool climate. With the recent trend toward grass and legume silage, more legumes may be grown; in 1956, 1,733 tons of grass silage were fed to livestock. The use of grass silage can effectively reduce the amount of imported mill feeds now required to maintain good milk production in the dairy herds.

About 90 acres of vegetables and 55 acres of tree fruits were grown in the County in 1956. Most of the tree-fruit acreage was in apple orchard, smaller areas being devoted to plums, pears and cherries.

A substantial acreage in the County is used for blueberry production. These are native low-bush blueberries and the fruit is taken from barren areas that have been systematically burned over to increase production and control bush growth.

About 25 acres of cultivated strawberries and one acre of cultivated raspberries were grown in the County in 1956.

Some income is derived from the sales of nursery stock, greenhouse products, and clover and timothy seed.

Dairying and mixed farming are the most important agricultural industries. About 50 per cent of the total milk production is sold as fluid milk. The remainder is used on the farm or sold as cream, butter or butterfat.

Land-Use Capability

A fairly large proportion of the soils in Yarmouth County are too stony for cultivation and should be left in forest. Others are too poorly drained, or are too shallow for agricultural development. The soils of the area were grouped according to the characteristics that make them suitable for use (Figure 5). In this classification scheme, there are seven classes in which the physical factors impose increasingly severe limitations on the use of land for crops. The classes may be subdivided into subclasses.

Classes I-IV are suitable for cultivated crops, pasture or wood land, but the alternative uses become fewer and the risks greater from class I to class IV. Classes V to VII are best suited to pasture or forest.

The subclass defines the kinds of limitation to agricultural use. These are considered under the headings of stoniness, wetness, shallowness and slope or erosion hazards.

Texture, structure, susceptibility to erosion, natural fertility, ease of cultivation, water-holding capacity and stoniness,—any one or a combination of these factors may limit the use of the soil. The soils that belong to each subclass and class are listed with their topographic and stoniness symbols as these appear on the soil map. The symbols for topography are:

- A: Level or nearly level, 0-3% slope
- B: Undulating, 3-8% slope
- C: Rolling, 8-16% slope
- D: Strongly rolling to hilly, 16-30% slope

The symbols for stoniness are:

- 0: Stone-free
- 1: Slightly stony; no hindrance to cultivation
- 2: Moderately stony; enough stone to interfere with cultivation unless removed
- 3: Very stony; sufficient stone to be a serious handicap to cultivation
- 4: Excessively stony; too stony for cultivation

CLASS I

Land in Class I is easy to work and can be cultivated safely by ordinary good farming methods. The soils are deep, fertile and productive. The land is nearly level and there is little or no erosion. The minimum frost-free period is 100 days.

No significant area of land in Yarmouth County meets these requirements.

CLASS II

Land of this class is nearly level to gently sloping with moderate susceptibility to erosion. The soils have moderate depth and favorable texture; the occasional moderate overflow or wetness can be corrected. They can be cultivated profitably with the aid of terracing, protective cover crops, and simple water-management operations.

Though areas of this class occur in the County, they are too small to be shown on a detailed reconnaissance map.

CLASS III

Land in this class is fairly good agricultural land, but has moderately severe limitations in its use. Erosion hazards range from light to moderate and may be severe on long C slopes. On slopes over 8 per cent not more than one cultivated crop in five years is recommended.

Other factors limiting the use of soils in this class are: slow internal drainage owing to a compact subsoil, as in soils of the Deerfield and Yarmouth series; shallowness as in the Bridgewater and Riverport soils; imperfect drainage as in the Riverport, Deerfield and Liverpool series; and poor drainage as in the Chegoggin series. Stoniness severely limits the land-use capabilities of all of these soils except the Chegoggin series. The coarse-textured Medway and LaHave series have a low moisture-holding capacity and may be shallow or stony, or both. The soils in Class III occupy 15.5 per cent of the County.

TABLE VII

SERIES, DESCRIPTIONS AND ACREAGES OF SOILS OF YARMOUTH COUNTY IN LAND-USE CAPABILITY CLASS III, THOSE WITH MODERATELY SEVERE LIMITATIONS

Land-Use Capability	Subclass		Soil Series, stoniness and topography	Acres
	Limitations	Texture		
Level to moderately steeply sloping land, susceptible to moderate erosion. Soils may have slow permeability, moderate overflow hazard, excessive wetness, shallowness, low moisture-holding capacity or low fertility. Choice of crops may be restricted.	Shallowness, compact subsoil, erosion hazard, inherent stoniness.	Medium-textured to moderately coarse textured soils.	Yarmouth B-2	288
			C-1	218
			C-2	28,506
			Mersey B-2	128
	Shallowness, imperfect drainage, compact subsoil, erosion hazard, inherent stoniness.	Coarse textured soils.	C-2	8,314
			Bridgewater C-2	3,488
				40,942
			Riverport B-2	2,506
			Deerfield B-2	18,976
			Liverpool B-2	10,898
			C-2	2,323
				34,703
	Low moisture-holding capacity, shallowness, inherent stoniness.	Moderately fine textured soils	Medway B-2	10,368
			LaHave B-2	1,920
				12,288
	Poor drainage		Chegoggin A-0	723
				723
			Total area	88,656 acres

CLASS IV

The choice of crops that may be grown on soils of this class is severely limited by natural features of slope, wetness or droughtiness and a large proportion of this land is best suited to pasture or forest.

Soils of the Halifax, Mersey and Yarmouth series in this class are steeply sloping, subject to hazards of erosion, and difficult to till or cultivate with conventional farm implements. The open, moderately coarse textured soils of the Halifax series have a low water-holding capacity and on this relief are noticeably droughty.

Medway soils with C slopes are very droughty and are better suited to forest. The deposits on which they have developed are of value for highway construction. The soils in Class IV occupy 10.7 per cent of Yarmouth County.

TABLE VIII

SERIES, DESCRIPTIONS AND ACREAGES OF SOILS OF YARMOUTH COUNTY IN LAND-USE CAPABILITY CLASS IV, THOSE WITH SEVERE LIMITATIONS

Land-Use Capability	Subclass		Soil Series, stoniness and topography		Acres
	Limitations	Texture			
Steep slopes, severe erosion hazard, inherent stoniness, imperfect drainage. Choice of crops may be limited. The number of years favorable for cultivated crops may be limited (1 in 6). Best suited to pasture or hay.	Erosion hazard, inherent stoniness, tillage problems, steep slopes.	Medium textured to moderately coarse textured soils.	Halifax	C-1	243
				C-2	35,110
			Mersey	D-2	960
				D-2	5,952
			Yarmouth	D-1	58
				D-2	77
					42,400
	Imperfect drainage, shallowness, inherent stoniness.		Danesville	B-2	16,547
				C-2	1,824
					18,371
Low moisture-holding capacity steep slopes, inherent stoniness.	Coarse textured soils	Medway	C-2	608	
				608	
			Total area	61,379 acres	

CLASS V

This land, which occupies about 9.3 per cent of the County, is not considered to be suitable for cultivation. In Class V is included nearly level land that has permanent wetness, stoniness or frequent overflow. Drainage is difficult and costly because of topography and location. Some areas can be used for pasture but forestry is the best use of most soils in Class V. A few areas of sphagnum peat could be adapted to the growing of crops by the use of special equipment and techniques.

CLASS VI

This land is too steep, stony, droughty, shallow or wet for cultivation. Most areas are suitable only for forestry but occasional small clearings may be used as rough pasture. Land in this class occupies about 28.8 per cent of Yarmouth County.

TABLE IX

SERIES, DESCRIPTIONS AND ACREAGES OF SOILS OF YARMOUTH COUNTY IN LAND-USE CAPABILITY CLASS V, THOSE SUITABLE FOR GRAZING OR FORESTRY

Land-Use Capability	Subclass		Soil Series, stoniness and topography	Acres
	Limitations	Texture		
Not suitable for cultivation, nearly level land with permanent wetness, stoniness, frequency of overflow, or climate that limits cultivation of crops. Grazing or forestry is best use.	Excessive wetness or inherent stoniness.	Medium textured to moderately coarse textured soils.	Middlewood A-2	205
			B-2	627
			Pitman A-2	10,062
			B-2	1,671
	Organic deposits.		Aspotogan A-2	2,918
			B-2	5,344
				20,827
		Moderately fine textured soils.	Salt marsh	8,416
				8,416
		Organic deposits.	Sedge Peat	6,061
			Sphagnum Peat	17,158
			Swamp	1,101
				24,320
			Total area	53,563

TABLE X

SERIES, DESCRIPTIONS AND ACREAGES OF SOILS OF YARMOUTH COUNTY IN LAND-USE CAPABILITY CLASS VI, THOSE LIMITED IN SUITABILITY FOR GRAZING OR FORESTRY

Land-Use Capability	Subclass		Soil Series, stoniness and topography	Acres
	Limitations	Texture		
Steep, stony, eroded, shallow, wet, or droughty land. Suitable for grazing or forestry with moderate limitations.	Stoniness, rock outcrops, shallowness.	Medium to moderately coarse textured soils.	Mersey B-3	2,624
			C-3	3,008
			D-3	2,496
			Yarmouth C-3	186
	Imperfectly drained, stony land.		Halifax C-3	106,163
			Gibraltar C-3	192
				114,669
	Poorly drained, stony land.		Liverpool B-3	10,061
			C-3	3,072
			Danesville B-3	10,221
			C-3	1,442
	Droughtiness, stoniness.	Coarse textured soils.	Bayswater B-3	160
				24,956
			Pitman A-3	333
			B-3	7,008
			Aspotogan A-3	2,918
			B-3	14,125
				24,384
			Medway C-3	448
			Coastal Beach	378
				826
			Total area	164,835 acres

CLASS VII

The land in this class is suitable only for forest. It includes very steep, stony, or very wet land and covers about 26.2 per cent of the surveyed area.

TABLE XI

SERIES, DESCRIPTIONS AND ACREAGES OF SOILS OF YARMOUTH COUNTY IN LAND-USE CAPABILITY CLASS VII, THOSE CHIEFLY USEFUL FOR FORESTRY AND WILDLIFE

Land-Use Capability	Subclass		Soil Series, stoniness and topography	Acres
	Limitations	Texture		
Very stony, steep, rocky, shallow, droughty or swampy land. Chiefly useful for forestry and wildlife. Limited areas suitable for grazing.	Very stony land.	Medium textured to moderately coarse textured soils.	Halifax C-4	15,014
			Yarmouth C-4	2,074
			Gibraltar B-4	90,077
			C-4	24,576
				131,741
	Imperfectly drained, very stony land.		Liverpool B-4	87
			Baywater B-4	7,336
			C-4	1,132
				8,575
	Excessively wet, very stony land.		Pitman B-4	2,624
			Aspotogan A-4	384
			B-4	6,976
				9,984
		Total area	150,300 acres	

Suitability of Soils for Crops—Soil Rating

In Yarmouth County, stoniness, drainage, texture, relief and natural fertility are all factors governing the suitability of soils for crop production. Areas classed as good crop land may have within their boundaries small areas generally unsuited to agriculture. Areas classed as poor crop land may have small areas suited to the growing of most crops. A soil rated as unsuitable for most crops may be ideally suited to some specialized production and be more valuable for that purpose than if a wide range of crops could be grown on it.

The presence of nearby markets for produce may make it economically feasible to clear and cultivate areas that should normally be left in forest. Conversely, it may be economically unsound to clear and cultivate more-favorable soils in inaccessible areas at this time.

In Table XII, the soils of land-use capability classes III and IV have been rated on their suitability for production of the principal crops grown in the area. These ratings are very general and apply to the soil areas as a whole rather than to individual areas that may be better or worse than average.

Classes V—VII are unsuitable for agriculture.

Soils normally unsuited to agricultural use have been cleared and farmed to a limited extent and where properly managed produce fair to good crops. The soil rating, while taking this into consideration, also has to cover the areas not cleared. When in the opinion of the surveyor these areas are too stony, too poorly drained or too coarse textured, they are classed as unsuitable for agriculture.

TABLE XII.—SUITABILITY* FOR SELECTED CROPS OF SOILS OF YARMOUTH COUNTY IN LAND-USE CAPABILITY CLASSES III AND IV

Soil Series	Acres	Hay	Grain	Pasture	Potatoes	Vegetables
CLASS III						
Good to Fair Crop Land						
Yarmouth.....	29,012	F-G	F-G	F-G	F-G	F-G
Mersey.....	8,443	F-G	F	F-G	F-G	F-G
Bridgewater.....	3,488	F-G	F-G	F-G	G	F
Riverport.....	2,506	F-G	F	F-G	F	F
Deerfield.....	18,976	G	F-G	G	F	F
Liverpool.....	13,222	F-G	F	F-G	F	F
Medway.....	10,368	F	F	F-P	F-G	F
LaHave.....	1,920	F	F	F	F-G	F
Cheggogin.....	723	G	F	G	P	F
CLASS IV						
Fair to Poor Crop Land						
Halifax.....	36,314	F-P	F-P	F	F-P	F-P
Mersey.....	5,952	P	P	F	P	P
Yarmouth.....	135	P	P	F	P	P
Danville.....	18,371	F-P	F-P	F-G	P	P
Medway.....	608	P	P	P	F-P	P

* G-Good; F-Fair; P-Poor

DISCUSSION OF ANALYTICAL DATA

Chemical and physical analyses of the more important soils found in the area are given in Tables XIII and XIV. Analysis of a surface or cultivated layer from one of the better agricultural soils has been included with the analyses of the profile samples taken under forested conditions.

LOSS ON IGNITION

This figure represents the loss of volatile material, other than free moisture, sustained by the soil when heated in a furnace at 550°C for four hours. The loss in weight is not all organic matter, but the relative amounts of humus in the soil are indicated by this determination. Normally a soil with a loss on ignition of 7 to 8 per cent is considered to be adequately supplied with humus. All the cultivated surface soils analyzed from the surveyed area have a higher proportion of volatile matter than the average for the Province. There should be no difficulty in maintaining organic-matter levels in the soils of this area provided sound cultural practices are observed. Barnyard manure should be carefully conserved and applied where most needed on the farm. It is extremely valuable for its plant nutrients and for improving both the quality and quantity of organic matter in the soil. On the moderately coarse textured soils common to the area, a high level of organic matter is necessary to conserve soil moisture in dry seasons.

pH

Several of the cultivated soils in the area had a pH of 6.1, which is well above normal for unlimed soils in the County. This would indicate that the fields where these samples were taken have received lime at some time. In general, the soils are very sour and require liming for good crop production.

LIME REQUIREMENT

The amount of lime needed in these soils to raise the pH in the surface soil to near neutrality ranges from two to ten tons per acre. The higher amounts are needed when the pH is low and the organic-matter content is exceptionally high. A substantial improvement in general crop production can usually be obtained with one or more applications of ground limestone at the rate of two to three tons to the acre. Not more than two to three tons need be applied in a single rotation. Soil acidity and lime requirement tests should be carried out on individual fields that have been previously treated, to guard against overliming.

NITROGEN

The total nitrogen content of the soils is adequate to supply the nitrogen requirements of most crops over a long period. This plant nutrient is usually found in the soil in direct proportion to the organic-matter content and nitrogen levels are usually adequate, if the organic-matter level is high. Applications of nitrogen fertilizers are necessary, however, to give crops a start in the early spring when biological activity is at a low level and conversion of nitrogen in organic form to available nitrogen is not sufficient to meet crop needs. The use of leguminous crops can augment the supply of nitrogen in the soil through fixation of atmospheric nitrogen by nodule bacteria on the plant roots.

AVAILABLE CALCIUM AND MAGNESIUM

With the exception of a few treated areas the soils of Yarmouth County are low in available calcium and magnesium. It is evident from Table XIV that continuous cropping could result in serious deficiencies, particularly of

magnesium. An actual deficiency of calcium is not likely to occur where commercial fertilizers are applied in quantity since superphosphate contains a large amount of this element. Dolomitic limestone may be used to raise the level of both calcium and magnesium and at the same time reduce soil acidity. Where magnesium deficiency symptoms occur in the crops, spraying with epsom salts is recommended as a corrective measure.

AVAILABLE POTASSIUM

All of the soils analyzed are low in available potassium and adequate amounts of this element should be applied to ensure good crop growth.

AVAILABLE PHOSPHORUS

The supply of available phosphorus is very low in every soil analyzed. This plant nutrient should be supplied as commercial fertilizer for good crop production. Liming will usually reduce the amount of applied phosphate fixed in unavailable forms by the soil, and thus make more available for plant use.

COBALT

Though no analysis is given here of cobalt levels in the soils of Yarmouth County, preliminary studies would indicate that a deficiency is commonly found in coastal regions where rainfall and leaching are relatively high. Low cobalt levels in the soil are reflected in forage crops, which fail to supply the cobalt requirements of sheep and cattle. The disease in livestock caused by this deficiency is known as "wasting disease" and can be cured or prevented by feeding a mineral mix containing cobalt chloride, or by applying cobalt salt to the soil at the rate of 2-4 oz. per acre annually.

TABLE XIV
AVAILABLE NUTRIENTS IN POUNDS PER ACRE IN YARMOUTH COUNTY
SOIL PROFILES

Series	Horizon	Depth In Inches	Ca	Mg	K	P
Yarmouth	A _e	0-6	3733	427	109	14
	A ₀	5-0	180	106	88	6
	A ₂	0-1	32	127	85	2
	B ₂₁	1-3	32	19	70	0
	B ₂₂	3-18	24	28	31	8
	C	18 +	24	45	31	8
Deerfield	A ₀	5-0	125	92	79	3
	A ₂	0-3	76	134	78	2
	B ₂₁	3-5	68	79	23	2
	B ₂₂	5-17	32	52	85	18
	C	17 +	32	40	31	36
Mersey	A ₀	3-0	419	143	91	5
	A ₂	0-1	56	187	85	8
	B ₂₁	1-4	24	67	62	10
	B ₂₂	4-18	56	26	23	14
	C	18 +	24	40	39	24
Medway	A ₀	2-0	46	60	77	5
	A ₂	0-2	56	67	31	10
	B ₂	2-12	16	26	31	16
	B ₃	12-22	12	52	31	18
	C	22 +	16	26	23	12

SUMMARY

Yarmouth County has a total area of 895 square miles or 573,228 acres. Approximately 15 per cent of this is occupied by water, swamp, peat bogs and salt marsh. Another 68 per cent is too stony or too poorly drained to be of any value except as forest land. The remaining 17 per cent ranges from good to submarginal agricultural land.

The topography of the County ranges from gently undulating to strongly rolling with the steeper slopes found on the drumlins. These drumlins are found from Port Maitland in the north to Argyle in the south. They also appear as small oval islands off the coast and in the estuary of the Tusket River. The County as a whole is a broad undulating plain rising steadily from the sea coast to an elevation of 500 feet at the northeastern extremity. A large proportion of the County is drained by the Tusket River and its tributaries.

The County was settled by the French early in the 17th century. Though scattered at the time of the "Expulsion" in 1755, many returned and their descendants live in a number of the coastal villages. Some of these villages have populations predominantly French in extraction. The establishment of English settlements in the County did not come until after the Expulsion when settlers from New England took up residence in the area.

The climate is humid temperate with an annual precipitation of approximately 46 inches. Precipitation and humidity are higher in the coastal region than farther inland.

The soils have developed from glacial till over most of the County. Textures range from coarse sandy loam to silt loam in the cultivated layer, while subsoil textures range from fine sandy loam to coarse sandy loam. The presence of stone is the main limiting factor in agricultural development of the area. All of the soils are somewhat stony with the exception of the Chegoggin series. The Bridgewater, Yarmouth, Deerfield and La Have series are less stony than other soils in the County and make up a large proportion of the total cultivated area. Even with some of these soils, there are large areas too stony to be cleared and farmed economically, particularly areas of the Deerfield series. Areas that have been cleared of stone are reasonably productive when properly managed and are suited to the growing of a wide range of crops.

Except for small, relatively stone free areas, the remaining soils can be classed as submarginal and should be allowed to remain in forest. Their agricultural value is limited chiefly by stoniness or drainage, or both. Topography and texture are also limiting factors of less importance.

Hay and grass are the most important field crops and approximately 90 per cent of the improved land is devoted to their production. The remaining 10 per cent is used for growing grain, root crops, potatoes, vegetables and small fruits. Dairying and mixed farming dominate the agricultural industry. Poultry, sheep and swine production form an important sideline on many farms.

Analyses of soil samples from the area show a fairly high level of organic matter in cultivated surface soils, particularly in coastal areas. A few fields have a favorable pH, but on the whole, the soils are sour and need lime. Most soils show a low content of available calcium and magnesium. Calcium deficiency can be corrected by liming, and dolomitic limestone will correct deficiencies of magnesium as well. Available potassium and phosphorus are low in practically all of the soils. These plant nutrients must be supplied in adequate amount if good crops are to be obtained. "Wasting disease" of sheep and cattle has been observed in the area. This disease is due to a deficiency of cobalt and can be treated either by feeding cobalt chloride in a mineral mix to the livestock or by applying cobalt salt to the soil at the rate of 2 to 4 oz. per acre annually.

**MAPS
NOT
FILMED**

**CARTES
OMISES**